REMARKS/ARGUMENTS

STATUS OF THE CLAIMS.

Claims 1, 4-9, 12, and 14-19 are pending in the application with entry of the current amendment. Claims 1, 12, and 17 are amended herein to more clearly describe embodiments of the invention, while claims 18 and 19 are newly added and claims 2, 3, 10, 11, and 13 are previously cancelled. These changes introduce no new matter and support is present in the application and claims as originally filed. The changes are made without prejudice and are not to be construed as abandonment of any previously claimed subject matter or agreement with any objection or rejection of record. Accordingly, entry of the Amendment is respectfully requested.

AMENDMENTS TO THE SPECIFICATION

Amendments are made to two paragraphs of the specification to correct typographical errors. Namely "unami" on pages 2 and 3 is changed to "umami." No new matter is added by the correction and Applicants respectfully request that the amendment be entered.

AMENDMENTS TO THE CLAIMS

Claims 1, 12, and 17 are amended herein and claims 18 and 19 are newly added. Support for such changes can be found through out the application as filed.

Examples of support for change concerning "transmembrane ion flux" can be found, e.g., at page 10, line 27; page 11, line 20; page 23, line 5; and especially page 25, line 22 through page 26, line 14. Support for "transmembrane potential" can be found, e.g., at page 6, line 12, page 8, line 20, page 10, line 27, and page 11, line 19. Support for "change in intracellular cAMP," etc. can be found at page 4, line 28, page 23, line 31 through page 24, line 2 and page 24, lines 3-32. Support for addition of new claims 18 and 19 can be found at, e.g., page 2, lines 1-10, page 3, lines 13-22, and page 6, lines 16-23.

Further support for the amendments herein is presented in additional detail below.

REJECTIONS TO THE CLAIMS

35 U.S.C. §112 Second Paragraph

Indefiniteness

Functional Effect

Claims 1, 4-9, 12, and 14-17 are rejected in the current Office Action under 35 U.S.C. §112, second paragraph, as allegedly indefinite by failing to particularly point out and distinctly claim the subject matter regarded by Applicants as the invention. Applicants herein amend. To the extent that the rejections remain after the current amendments, Applicants respectfully traverse.

The claims are rejected as allegedly indefinite in their use of the phrase "functional effect." The Office Action contends that the claims are "open-ended with regard to what functional effect is to be identified" due to the term "comprises." Thus, the claims "could (or could not) include practically any functional effect." In order to more clearly claim the current embodiment, Applicants herein amend claims 1, 12, and 17 to read "wherein the function effect is chosen from the group consisting of." Such change limits the currently claimed embodiment to those functional effects recited in the claims. Thus, since the language upon which the rejection was based has been removed, Applicants respectfully request that the rejection be withdrawn.

Under the influence

Claims 1, 4-9, 12, and 14-17 are also rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite for use of the term "under the influence" in the phrase "wherein the functional effect is under the influence of the taste cell-specific ion channel subunit." Applicants respectfully traverse.

The Office Action alleges that indefiniteness arises because "the specification apparently mischaracterizes the functional activity of the TC-ICS" on pages 53 and 54. The Office Action alleges that the specification assumes that the TC-ICS is a Ca^{++} channel and would thus increase intracellular Ca^{++} by bringing in Ca^{++} through the plasma membrane.

However, Applicants respectfully point out that the application as filed does not state or imply such a mechanism for TC-ICS. Rather than discussing changes in intracellular Ca^{++} in terms of an influx from outside the cell through the TC-ICS, the specification describes changes in

intracellular Ca^{++} in terms of second messaging within the cell, etc. For example, page 10, lines 24-31 defines "functional effect" as including change in "second messenger concentrations (e.g., cAMP, IP_3, or intracellular Ca^{2+})." Similar and related points are made on page 23, lines 1-9, page 24, lines 3-32, etc. In the description of Ca^{++} on pages 53-54, it is not stated that TC-ICS is a Ca^{++} channel, but rather that modulation of TC-ICS function can be assayed by following changes in intracellular Ca^{++} (e.g., as a second messenger in the signaling pathway, etc.). Thus, the specification does not mischaracterize the functional activity of TC-ICS by stating or suggesting that it is a Ca^{++} channel.

Therefore, since the application does not mischaracterize the function of TC-ICS by stating or implying that it is a Ca^{++} channel, it is not confounding to those of skill as to what is meant by a change in intracellular ion concentration, a change in Ca^{++}, etc. Because the application does not mischaracterize the function of TC-ICS, the claims are not indefinite and Applicants respectfully request that the rejection be withdrawn.

Change in intracellular Ca^{++}

The Office Action also alleges that the phrase "a change in intracellular Ca^{2+}" is indefinite because it does not describe what is changing in regard to intracellular Ca^{++} (e.g., concentration, localization, or isotopic composition). The Office Action, thus, alleges that the phrase is incomplete and indefinite. Applicants respectfully traverse.

Any change in intracellular Ca^{++} concentration can routinely be measured by available techniques, as clearly described in the specification. *See generally*, pages 23-28. Measurement of changes in intracellular ion concentration, e.g., Ca^{++}, is quite well known in the art and would not be seen as indefinite to those of skill. The common nature of such measurements is illustrated by the references listed in the application, e.g., page 25, lines 18-21. The age of the references (from the 1980s and 1990s) illustrates that measurement of intracellular ion concentration has been known and practiced for a considerable period of time. The application emphasizes the ubiquity of intracellular ion concentration measurements in the field and the familiarity that those of skill would have with such assays.

Because the term "change in intracellular Ca^{++}" would be understood by those of skill in the art, as illustrated by the references and description in the specification, the phrase is not indefinite and Applicants respectfully request that the rejection be withdrawn.

35 U.S.C. §112 First Paragraph

Enablement

Claims 1, 4-9, 12, and 14-17 are rejected under 35 U.S.C. § 112, first paragraph as allegedly failing to comply with the enablement requirement. Applicants respectfully traverse.

As put forth in M.P.E.P. §2164.01, the test for enablement is whether those reasonably skilled in the art can make or use the invention based on the disclosures in the patent, along with information known in the art, without undue experimentation. In fact, it is preferable to omit that which is well known in the art. *See, e.g.*, M.P.E.P. §2164.01; *United States v. Telectronics, Inc.*, 857 F.2d 778, 8 USPQ2d 1217, (Fed. Cir. 1998); and, *In re Buchner*, 929 F.2d 660, 18 USPQ2d 1331, (Fed. Cir. 1991). Just because experimentation may be complex does not necessarily make it undue if the art typically engages in such experimentation. The test for undue experimentation is not just quantitative "since a considerable amount of experimentation is permissible, if it is merely routine, or if the specification in question provides a reasonable amount of guidance with respect to the direction in which the experimentation should proceed." *See In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988).

The Office Action contends that in order to practice the invention, one skilled in the art "would need to know which...assays and which materials could be used in conjunction with the polypeptide of SEQ ID NO: 8" because of the "multitude of assays, used in the art to study particular biochemical pathways involved with different aspects taste signal transduction as well as signal transduction in general."

The Office Action contends that the specification "admits that it is well recognized in the art that the signal transduction schemes underlying taste transduction are bewilderingly complex and poorly understood," and that it would require an extensive (and unduly burdensome) research plan to try to use the invention as claimed. Applicants respectfully traverse.

Applicants point out that the current embodiment claimed recites specific procedures (namely, tracking intracellular ion concentration, changes in transmembrane ion flux, changes in membrane potential, changes in intracellular cAMP, cGMP, IP_3 or DAG, and changes in intracellular Ca^{++} all wherein the functional effect is a change other than a change from calcium ion influx through TC-ICS) in order to follow the functional effect, if any, of a compound on the

cells/membranes comprising the sequences of the invention. While, it will be appreciated that Applicants expressly reserve the right to pursue measurement of other functional effects in further prosecution, it is clear that such specific recitation of uses is not an open-ended list of various assays.

Notwithstanding any complexity in the various taste pathways, the assays to screen for possible changes in intracellular ion concentration, ion flux, and intracellular Ca^{++}, etc., in response to a putative modulator are relatively straightforward. The specification gives examples of various methods (*e.g.*, via dye localization, patch clamps, etc.) to measure any changes in intracellular ion concentration, etc., that may result from a putative modulator. For example, page 25 discusses and gives examples of changes in intracellular Ca^{++} levels (and ways to measure such), changes in ion flux (and ways to measure such), etc., as well as citations to references presenting further detail and guidance.

Also, Applicants point out that, as emphasized throughout the specification as filed and as evidenced by the numerous citations given within the specification, those of skill in the art are extremely familiar with, and routinely perform, assays to measure/quantify functional effects of modulators on cells/cell membranes, *e.g.*, by measuring ion flux, changes in intracellular Ca^{++}, etc. Furthermore, the level of skill in the area is quite high, and the specification cites to multiple journal articles detailing protocols to guide those of skill in the art in any experimentation. Any experimentation involved would thus be merely routine, since such assays are common in the art (as evidenced by the numerous citations in the specification). As such, the routine experimentation is not unduly burdensome.

The current claims recite exemplary assays to test for the functional effect, if any, of putative modulators on TC-ICS. Because the level of skill in the art is high, the specification cites to numerous sources of guidance, and the types of experiments that might be needed are those that are routinely performed in the art, the breadth of the claims is fully enabled and Applicants respectfully request that the rejection be withdrawn.

The Office Action also alleges that the application mischaracterizes the function of TC-ICS by assuming that it is a Ca^{++} channel. Such alleged mischaracterization would thus lead those skilled in the art to "wrongly attribute changes in intracellular Ca^{++} concentration, localization, etc...to effects of the compound on the TC-ICS and would thus not be practicing the invention as claimed."

However, as emphasized herein, the application does not mischaracterize the function of TC-ICS and does not state or imply that TC-ICS is a Ca^{++} channel. Thus, since the function is not mischaracterized, the claims are enabled and those of skill in the art would be able to make/use the invention based on the specification and the level of skill in the art. Furthermore, as explained below, the claims are amended to clearly differentiate from such mischaracterization. Therefore, Applicants respectfully request that the rejection be withdrawn.

The Office Action also rejects claims 12, and 14-15 as allegedly lacking enablement because "there is no teaching of compounds that directly modulate the activity of the polypeptide of SEQ ID NO: 8." The Office Action alleges that "one of skill in the art would view the invitation to randomly sample chemicals in the hope of finding such would be unduly burdensome." Applicants respectfully traverse.

Prior amendments to claim 12 clarified the requirement of steps to identify modulating compounds. Thus, one part of claim 12 is to actually screen for/identify such compounds (which is similar to claim 1). The goal of the cited claims, *inter alia*, is to identify such compounds. Furthermore, as explained in the specification (*e.g.*, p 28, line 21 through page 30, line 30, etc.), screening of libraries for modulators and the like is very common and well known in the art. Given the large amount of guidance (e.g., as presented by the numerous references in the specification) for screening for functional effect, such screening, even if it is of non-trivial amount, is routine in the field and, thus, not unduly burdensome. Because the identifying of modulators is one of the points/goals of the claims and it would not be unduly burdensome on a user, Applicants respectfully request that the rejection be withdrawn.

Written Description

Claims 1, 4-9, 12, and 14-17 are rejected in the Office Action as allegedly lacking adequate written description under U.S.C. §112, first paragraph. Applicants respectfully traverse. It is assumed that the rejections starting on the bottom of page 6 are meant to be presented as "written description" rejections, and are addressed as such, since the same claims are already given "enablement" rejections on pages 5-6.

In order to satisfy the written description requirement, M.P.E.P. §2163(I) states that "a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention."

The Office Action alleges that claims 12, and 14-15 lack adequate written description because they do not teach compounds that modulate activity of the polypeptide of SEQ ID NO: 8. Applicants respectfully traverse.

As described above, an aspect of claims 12-15 is the identification of (e.g., the screening for) compounds having a functional effect. The screening for identification of such compounds (similar to claim 1) is part of the claimed method. The claims are drawn to a method of modulating taste signaling by first identifying particular compounds through their functional effect on cells/cell membranes that express the polypeptides of the invention, and then using such identified compounds to modulate taste signaling. Claims to screening/identification of compounds (and methods comprising such identified compounds) are quite common and well known in the art. *See above.* Thus, because a feature of the claim is the identification of compounds that modulate SEQ ID NO:8 (or SEQ ID NO: 2 or SEQ ID NO: 5), Applicants respectfully request that the rejection be withdrawn.

The Office Action again alleges that the application mischaracterizes the function of TC-ICS so that those of skill would not recognize that Applicants were in possession of the invention. Again, Applicants emphasize that the specification does not mischaracterize the function of TC-ICS. Thus, since the function of TC-ICS is not mischaracterized there would be no issue of those of skill in the art not recognizing that Applicants were in possession of the invention. Applicants therefore respectfully request that the rejection be withdrawn.

35 U.S.C. §102(e)/Interference

Claims 1, 4-9, 12, and 14-17 are rejected in the current Office Action under 35 U.S.C. § 102(e) as allegedly anticipated by US Patent Publication 20020037515. Applicants herein amend and respectfully traverse to the extent that rejections remain after the current amendment.

The Office Action alleges that the application is unpatentable over claims 17, 18, and 21 of Publication 20020037515 and compares such claims against the claims of the current

application. The Office Action states that the cited publication "can only be overcome by establishing priority of invention through interference proceedings."

As explained in *Winter v. Fujita*, 53 USPQ2d 1234, in order for an interference proceeding to be proper, there must be two-way anticipation or obviousness. Thus, for an interference to exist between two inventions (e.g., between two applications), each of them must anticipate or make obvious the other. If one of the two inventions is patentably distinct (i.e., if there is only one-way anticipation/obviousness) then an interference proceeding is not appropriate.

Applicants herein amend claims 1, 12, and 17 to emphasize the distinction between the current claims and those of Publication 20020037515. Thus, the current claims are amended to specifically state that determination of a functional effect is wherein the effect is a change other than a change in Ca^{++} influx through TC-ICS.

Thus, there is no two-way anticipation between the current application and the cited reference since the current claims are of distinctly different scope than those of Publication 20020037515. Furthermore, there is no two-way obviousness between the current application and the cited reference since based on the cited publication, it would not be obvious to limit a "functional effect" to only those other than Ca^{++} influx through TC-ICS. Publication 20020037515 specifically states that channel function is measured by Ca^{++} influx through TC-ICS, i.e., that TC-ICS (trpm8 in the cited reference) is actually a calcium ion channel. *See*, e.g., Publication 20020037515 paragraphs 11, 57, etc. Publication 20020037515 clearly and explicitly mischaracterizes the function of TC-ICS. As explained herein, however, the current application does not mischaracterize the function of TC-ICS.

Support for the amendment herein can be found throughout the application as filed. For example, the specification repeatedly describes measurement of intracellular Ca^{++} changes in determining functional effect as relating to secondary messengers, etc., rather than to primary Ca^{++} influx through TC-ICS. *See*, e.g., page 10, lines 24-31, page 23, lines 1-9, page 24, lines 19-32, etc. This is contrary to the mechanism alleged in Pub. 20020037515. Thus, by inference, the changes in intracellular Ca^{++} are not due to Ca^{++} influx through TC-ICS since they are only described in terms of, e.g., secondary messengers and not in terms of primary calcium ion influx through TC-ICS.

Since there is no two-way anticipation/obviousness between the claims of Publication 20020037515 and the current invention, an interference proceeding is not appropriate. Furthermore,

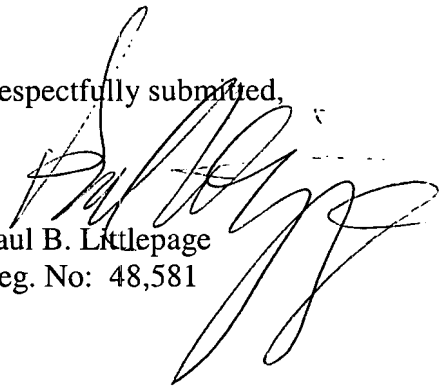
the current claims are not anticipated by the claims of Publication 20020037515 since such claims do not contain all limitations of the current claims. Thus, Applicants respectfully request that the rejection be withdrawn.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested. In the event that substantive matters are felt to remain, the Examiner is invited to telephone the undersigned at (510) 769-3507.

QUINE INTELLECTUAL PROPERTY LAW
GROUP, P.C.
P.O. BOX 458
Alameda, CA 94501
Tel: 510 337-7871
Fax: 510 337-7877

Respectfully submitted,



Paul B. Littlepage
Reg. No: 48,581